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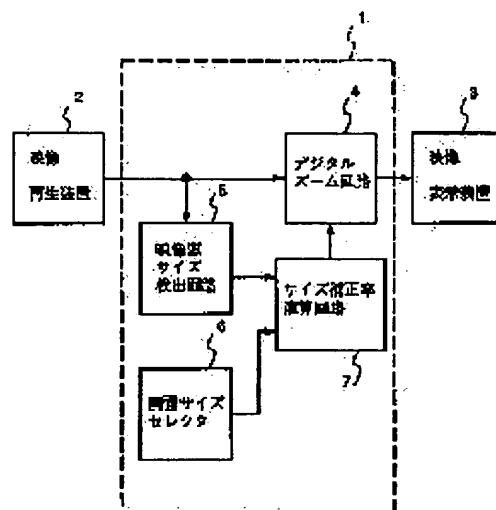
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(54) VIDEO SIZE CORRECTOR

(57)Abstract:

PURPOSE: To enable automatic display of videos at the same size as in the case where the videos are displayed in a screen size which is a reference for a video source without depending on display screen sizes.

CONSTITUTION: This video size corrector has a video source size detecting circuit 5 which detects the size of the videos from a video reproducing device 2, a screen size selector 6 which selects the display side of a video display device 3, a size correction rate calculating circuit 7 which outputs the correction rate of the video size in accordance with the size information from the video source size detecting circuit 5 and a screen size selector 6, and a digital zooming circuit 4 which outputs the videos from the video reproducing device 2 to the video display device 3 by magnifying or reducing these videos in accordance with the correction rate of the video size from this size correction rate calculating circuit 7.



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CLAIMS

[Claim(s)]

[Claim 1] The image size compensator characterized by generating the correction factor of desired image size from the display size of this source of an image that is said a part of source of an image, and the display size of said graphic display device, being based on this correction factor in the image size compensator which amends the size of the image from the source of an image, and is displayed on a graphic display device, and expanding or reducing said source of an image.

[Claim 2] In the image size compensator which amends the size of the image from the source of an image, and is displayed on a graphic display device A display-size assignment means to specify a predetermined combination of the display size of this source of an image recorded as said a part of source of an image, and the display size of said graphic display device, A size correction factor generation means to generate the correction factor of the image size of said source of an image based on the information from this display-size assignment means, The image size compensator characterized by including an image enlarging-or-contracting means to be based on the correction factor of the image size from this size correction factor generation means, to expand or reduce the image from said picture reproducer, and to output to said graphic display device.

[Claim 3] Said display-size assignment means is an image size compensator according to claim 2 characterized by including a source size detection means of an image to detect the display size of this source of an image recorded as said a part of source of an image, and the screen size selector which specifies the display size of said graphic display device.

[Claim 4] Said display-size assignment means is an image size compensator according to claim 2 characterized by including a source size detection means of an image to detect the display size of this source of an image recorded as said a part of source of an image, and a screen size detection means to detect the display size of this graphic display device from said graphic display device.

[Claim 5] Said size correction factor generation means is an image size compensator according to claim 3 or 4 characterized by including the conversion table of the combination of the size of the image from said source of an image, and the display size of said graphic display device, and said correction factor.

[Claim 6] Said size correction factor generation means is an image size compensator according to claim 3 or 4 characterized by including the computing element which generates said correction factor from the size of the image from said source of an image, and the display size of said graphic display device.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the image size compensator which amends image size automatically from especially the size of the source of an image, and the size which should be displayed about the image size compensator which amends image size in case the size of the source of an image differs from the size which should be displayed.

[0002]

[Description of the Prior Art] As for the image by picture reproducer etc., it is common that the magnitude of the photographic subject displayed differs by the case where it displays with the graphic display device of the case where it displays with the graphic display device of a certain display size, and other display sizes. For example, in using the same source of an image, the photographic subject with which the direction of a 36 inches graphic display device is displayed becomes large rather than a 29 inches graphic display device.

[0003] Therefore, when it is going to keep the magnitude of a photographic subject constant also in the graphic display device of different size, the need of expanding or reducing the size of an image with other means arises, creating the source of an image for every size of a graphic display device, or using the same source of an image.

[0004]

[Problem(s) to be Solved by the Invention] However, if it is creating the source of an image for every display size of a graphic display device, the class of source of an image to create increases and it is not realistic. Moreover, if it is expanding or reducing the size of an image, using the same source of an image so that the magnitude of a photographic subject may be kept constant, the need of carrying out delicate size adjustment will arise, taking into consideration the size of the source of an image, and the display size of a graphic display device. In order to carry out this adjustment, the ruler used as criteria etc. is displayed on a graphic display device, and size adjustment will be performed, comparing this with actual magnitude. It must carry out, whenever it is necessary to do such an activity for every graphic display device and the sources of an image differ.

[0005] On the other hand, the size of the source of an image is decided to be a meaning for every source of an image, and the display size of a graphic display device becomes settled physically for every graphic display device. Therefore, it is not necessarily a best policy to perform the above-mentioned adjustment each time.

[0006] The purpose of this invention is to offer the image size compensator which performs expansion or contraction of the source of an image so that the magnitude of a photographic subject may be kept constant to the size of a different source of an image, and different size of a graphic display device.

[0007] Moreover, other purposes of this invention are to the size of a different source of an image, and different size of a graphic display device to keep the magnitude of a photographic subject constant, without preparing the separate source of an image.

[0008]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, in the image size compensator which amends the size of the image from the source of an image, and is displayed on a graphic display device, the image size compensator of this invention generates the correction factor of desired image size from the display size of this source of an image that is said a part of source of an image, and the display size of said graphic display device, is based on this correction factor, and expands or reduces said source of an image.

[0009] Moreover, other image size compensators of this invention are set to the image size compensator which amends the size of the image from the source of an image, and is displayed on a graphic display device. A display-size assignment means to specify a predetermined combination of the display size of this source of an image recorded as said a part of source of an image, and the display size of said graphic display device, A size correction factor generation means to generate the correction factor of the image size of said source of an image based on the information from this display-size assignment means, An image enlarging-or-contracting means to be based on the correction factor of the image size from this size correction factor generation means, to expand or reduce the image from said picture reproducer, and to output to said graphic display device is included.

[0010] Moreover, other image size compensators of this invention contain a source size detection means of an image to detect the display size of this source of an image recorded as said a part of source of an image, and the screen size selector which specifies the display size of said graphic display device in said display-size assignment means.

[0011] Moreover, other image size compensators of this invention include a source size detection means of an image to detect the display size of this source of an image recorded as said a part of source of an image, and a screen size detection means to detect the display size of this graphic display device from said graphic display device, in said display-size assignment means.

[0012] Moreover, other image size compensators of this invention contain the conversion table of the combination of the size of the image from said source of an image, and the display size of said graphic display device, and said correction factor in said size correction factor generation means.

[0013] Moreover, other image size compensators of this invention contain the computing element which generates said correction factor from the size of the image from said source of an image, and the display size of said graphic display device in said size correction factor generation means.

[0014]

[Example] Next, the first example of the image size compensator of this invention is explained to a detail with reference to a drawing.

[0015] If drawing 1 is referred to, the image size compensator which is the first example of this invention The source size detector 5 of an image which detects the size of the source of an image with the signal from picture reproducer 2, The screen size selector 6 which chooses the display size of a graphic display device 3, and the source size detector 5 of an image and the size correction factor arithmetic circuit 7 which outputs the correction factor of image size based on the size information from the screen size selector 6, It has the digital zoom circuit 4 which is based on the correction factor of the image size from the size correction factor arithmetic circuit 7, expands or reduces the image from picture reproducer 2, and is outputted to a graphic display device 3.

[0016] Picture reproducer 2 can reproduce an image from a laser disk, a video tape, etc., and various things, such as a laser disk regenerative apparatus and a video tape regenerative apparatus, can be used for it. A graphic display device 3 can display the source of an image from the picture reproducer 2 amended by the image size compensator 1, and various things, such as what is depended on the Braun tube, and a thing using liquid crystal, can be used for it.

[0017] The digital zoom circuit 4 reads only the range held and displayed on the memory of built-in of the image from picture reproducer 2 in every 1 field (after-mentioned), performs expansion or contraction, and achieves the same function as what is used from the former. In case it expands, the range which should be displayed with pointing devices, such as a joy stick and a trackball, is specified. Moreover, in case it reduces, the core of an image is automatically doubled with the core of the display screen, and it displays on middle of the screen.

[0018] The screen size selector 6 has the knob which sets up the display size of the screen of a graphic display device 3. For example, when the display size of a graphic display device 3 is 32 inches, the screen size selector 6 is set as "32." In addition, this screen size selector 6 may be the switch of a slide mold, a push button-type switch, etc.

[0019] Drawing 2 is the outline of the signal sent to the image size compensator 1 from picture reproducer 2. There are the 525 scanning lines for one screen in a graphic display device, and after performing a horizontal scanning for this every other and constituting the screen of one sheet, generally the approach by interlaced scanning of scanning the part left behind by the 2nd sheet is performed. About such a standard method, "the volume television image information engineering handbook and on television society, Ohm-Sha, November 30, 1990 issue", etc. can be referred to, for example. In this case, the screen which consisted of one interlaced scanning is called the field, and the screen which became perfect by two interlaced scanning is called a frame. The signal of drawing 2 expresses a part for the 1 field.

[0020] Reference of drawing 2 roughly divides the signal for the 1 field into the graphic display period 22 including a video signal, and the vertical blanking interval 23 containing a vertical synchronization. The graphic display period 22 includes the horizontal scanning period 21 equivalent to scanning-line 1 duty by scanning-line 241.5 (= 525 / 2-21) book. Here, a vertical blanking interval 23 shall be equivalent to scanning-line 21 duty. This horizontal scanning period 21 includes the Horizontal Synchronizing signal which is a synchronizing signal to scanning-line [besides the video signal of scanning-line 1 duty used for graphic display] 1 duty. This synchronizing signal is for scanning to the same timing by the receiving side and the transmitting side, and has the Vertical Synchronizing signal mentioned later besides a Horizontal Synchronizing signal here.

[0021] If drawing 3 is referred to, the vertical synchronizing pulse period 10 and the scanning-line 3 following duty are made to 2nd equalizing pulse period 9b, and the vertical blanking interval 23 makes [scanning-line 3 duty which shall be equivalent to scanning-line 21 duty here, and is begun] the remaining part the intact scanning-line period 11 for 1st equalizing pulse period 9a and the scanning-line 3 following duty. The vertical synchronizing pulse period 10 has the role which takes the synchronization of the vertical fly-back line, and the equalizing pulse periods 9a and 9b have the role which maintains this vertical synchronization at stability.

[0022] The intact scanning-line period 11 is not used for a transfer of an original video signal. In this invention, the image size compensator 1 is told about the source size of an image by transmitting the source size signal 13 of an image at the specific horizontal scanning period 12 of this intact scanning-line period 11.

[0023] When drawing 4 is referred to, the source size signal 13 of an image is a 20-bit signal which expressed with the denary-sized binary digit (BCD) of 4 bits each digit of the size of the source of an image which consists of triple figures, and added the header 4 bits each and the footer before and after that. A header and a footer show the start of the signal concerned, and the end, respectively, and even if they are which horizontal scanning period 12 within the intact scanning-line period 11 by this, they can recognize that it is the source size signal 13 of an image.

[0024] If the header currently recorded on the vertical blanking interval 23 of a video signal is detected, the source size detector 5 of an image will read the source size of an image which continues after that until it detects a footer, and will output the source size of an image to the size correction factor arithmetic circuit 7.

[0025] If drawing 5 is referred to, the size correction factor arithmetic circuit 7 will store the correction factor conversion table in ROM etc., and will acquire the scale factor of the correction factor of a screen size, i.e., expansion, and contraction with the combination of the display size directed by the source size detector 5 of an image, and the screen size selector 6.

[0026] Here, a correction factor conversion table is accessed as follows. In a correction factor conversion table, when the number of the classes of b and screen size is set to B for the value a and the screen size selector 6 instruct the value which the source size detector 5 of an image directs to be noting that the combination of the source size of an image and a screen size is regularly located in a line like drawing 5, the entry number C of a correction factor conversion table is expressed with a degree type.

[0027] B is "4" and a and b direct "3" $C=B \times a + b$, however here at the time of "2" and 27 inches at the time of "1" and 29 inches at the time of "0" and 32 inches at the time of 36 inches. Moreover, C takes values, such as "0", "1", and "2", sequentially from a top in drawing 5.

[0028] the case where for example, the source size of an image is [the display size of a graphic display device] 32 inches in 36 inches -- a = -- "0" and b = -- since it is "1", it turns out that it is set to $C=4 \times 0 + 1=1$, and a correction factor should just

"double +11.1% of an image, i.e., a source, 1.111 with reference to the 2nd step of correction factor from on a correction factor conversion table.

[0029] Thus, the acquired correction factor is outputted to the digital zoom circuit 4, and is used for expansion or contraction of an image.

[0030] In addition, the size correction factor arithmetic circuit 7 may ask for a correction factor by calculating with a computing element etc. from the display size directed to the source size detector 5 of an image, and the screen size selector 6, without having a correction factor conversion table.

[0031] Thus, according to the image size compensator 1 which is the first example of this invention, the expansion or contraction in the digital zoom circuit 4 is automatically performed by setting the display size of a graphic display device 3 as the screen size selector 6, detecting the source size of an image from the signal from picture reproducer 2 in the source size detector 5 of an image, and acquiring a correction factor automatically by the size correction-factor arithmetic circuit 7.

[0032] Next, the second example of the image size compensator of this invention is explained to a detail with reference to a drawing.

[0033] If drawing 6 is referred to, the image size compensator which is the second example of this invention replaces the screen size selector 6 of the first example in the screen size detector 16, and it is constituted so that the signal from a graphic display device 3 may detect the display size of a graphic display device 3 in this screen size detector 16.

[0034] In a graphic display device 3, it has a means for memorizing the display size. For example, a display size is set up with "3" etc. like the screen size selector 6 with two or more DIP switches etc. at the time of "2" and 27 inches at the time of "1" and 29 inches at the time of "0" and 32 inches at the time of 36 inches.

[0035] The screen size detector 16 detects the display size of a graphic display device 3, and notifies this to the size correction factor arithmetic circuit 7. Like the case of the first example, the size correction factor arithmetic circuit 7 stores the correction factor conversion table in ROM etc., and acquires the scale factor of the correction factor of a screen size, i.e., expansion, and contraction with the combination of the display size directed by the source size detector 5 of an image, and the screen size detector 16. Thereby, the digital zoom circuit 4 is held like the first example in the memory of built-in of the image from picture reproducer 2 in every field, and performs expansion or contraction, and an image is displayed on a graphic display device 3.

[0036] Thus, compared with the first example, by having detected the display size of a graphic display device 3 in the screen size detector 16, it becomes unnecessary to set up the display size of a graphic display device 3 by the selector, and, according to the image size compensator 1 which is the second example of this invention, adjustment of a display size is automatically performed also in the cases, such as exchange of a graphic display device 3.

[0037]

[Effect of the Invention] By the above explanation, according to this invention, the correction factor of image size is automatically called for from the size of the source of an image, and a screen size so that clearly, and expansion or contraction of an image is performed automatically. The magnitude of a photographic subject can be kept the same by the same source of an image to the graphic display device which has a different display size by this.

[0038] Moreover, since what is necessary is just to choose a display size from the values which were able to be defined beforehand, it is not necessary to carry out fine adjustment of image size, and operability improves.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the first example of the image size compensator of this invention.

[Drawing 2] It is drawing showing the configuration of the field signal in the image size compensator of one example of this invention.

[Drawing 3] It is drawing showing the configuration of the vertical blanking interval of the field signal in the image size compensator of one example of this invention.

[Drawing 4] It is drawing showing the configuration of the source size signal of an image in the image size compensator of the first example of this invention.

[Drawing 5] It is drawing showing the correction factor conversion table of the size correction factor arithmetic circuit in the image size compensator of this invention.

[Drawing 6] It is the block diagram showing the configuration of the second example of the image size compensator of this invention.

[Description of Notations]

- 1 Image Size Compensator
- 2 Picture Reproducer
- 3 Graphic Display Device
- 4 Digital Zoom Circuit
- 5 Source Size Detector of Image
- 6 Screen Size Selector
- 9a, 9b Equalizing pulse period
- 10 Vertical Synchronizing Pulse Period
- 11 Intact Scanning-Line Period
- 12 Horizontal Scanning Period
- 13 Source Size Signal of Image
- 16 Screen Size Selector
- 20 Field Signal
- 21 Horizontal Scanning Period
- 22 Graphic Display Period
- 23 Vertical Blanking Interval

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